In the Claims:

1. (original) A control method for controlling the operating mode of an IC engine, in which a control device comprises a device for sampling signals, a downstream arranged device for frequency analysis and a downstream arranged device for cylinder classification, in which at first a speed signal is detected and subsequently the speed signal is transformed into an angle-frequency-range, characterized in that the transformation is effected by means of a Hartley-transformation.

2. (original) A method according to claim 1, characterized in that an engine smoothness control is performed, in which the uneven running of an IC engine is detected and controlled.

Claims **3 to 23** (canceled).

24. (new) A method according to claim 1, characterized in that in case of a quasi-stationary operating state the mean value, in particular an arithmetic mean value, is averaged starting from at least two successive speed segments.

25. (new) A method according to claim 2, characterized in that for assessing the uneven running the speed signal is separated into individual angle-frequencies (orders).

26. (new) A method according to claim 1, characterized in that parasitic effects in the calculated complex numerical values and/or the reference phases are subjected to a towed correction and thus are eliminated.

27. (new) A method according to claim 1, characterized in that by means of the reference phases assigned to the measured phases and the measured amplitudes and phases assessment criteria are established while taking into account the respective load and speed situation, with the aid of which criteria the cylinders to be adjusted and their necessary direction of adjustment are determined.

28. (new) A method according to claim 1, characterized in that misfires are recognized, in which unwanted misfires of an IC engine are detected and corrected.

29. (new) A method according to claim 28, characterized in that for detecting the misfires mainly low-frequent spectral portions are used.

30. (new) A method according to claim 28, characterized in that the detection of the misfires is performed with the aid of speed and load dependent reference phases, which are stored in advance for the relevant orders in the control device.

31. (new) A method according to claim 1, characterized in that by means of the reference phases and the calibration factor

a reference phase criteria is determined and in that the misfiring cylinders are identified while taking into account the respective exceedings of at least one threshold value and the knowledge of the respective first cylinder.

32. (new) A method according to claim 1, characterized in that a torque tracing and power tracing, respectively, is performed, in which a decrease caused by aging of the engine power of the IC engine is detected and corrected.

33. (new) A method according to claim 32, characterized in that the adaptation of the engine torque and the engine power, respectively, is corrected by adjusting the injected fuel quantity.

34. (new) A method according to claim 32, characterized in that an amplitude, which is a measurement for the released engine torque and the released engine power, respectively, is detected in case of a reference engine and is stored dependent from the speed in a family of characteristics.

35. (new) A device for controlling the operating mode of an IC engine of a motor vehicle, by means of a method according to claim 1,

with a device for sampling signals,

with a device for frequency analysis arranged downstream of the device for sampling signals,

with a device for cylinder classification arranged downstream of the device for frequency analysis.

36. (new) A device according to claim 35, characterized in that a device for averaging an arithmetic mean value is provided.

37. (new) A device according to claim 36, characterized in that the device for averaging an arithmetic mean value is arranged between the device for sampling signals and the device for frequency analysis.

38. (new) A device according to claim 35, characterized in that a device for correcting the frequency portions is provided.

39. (new) A device according to claim 38, characterized in that the device for correcting the frequency portions is arranged between the device for frequency analysis and the device for cylinder classification.

40. (new) A device according to claim 35, characterized in that the device for the cylinder classification comprises at least one of the following means:

means for reference phase generation;
means for reference phase calibration;
means for reference phase selection;
device for determining assessment criteria;
unit for determining the main causers and/or secondary

causers of a disturbance and/or a deviation;

unit for determining the qualitative and/or quantitative adjustment measures.

41. (new) A device according to claim 35, characterized in that a controller, in particular an I-controller or a PI-controller is arranged downstream to the device for cylinder classification.

42. (new) A device according to claim 35, characterized in that a device for recognizing misfires (Misfire Detection) is provided.

43. (new) A device according to claim 35, characterized in that a device for torque tracing and power tracing, respectively, is provided.

44. (new) An IC engine in a motor vehicle with at least one cylinder and with at least one engine control, characterized in that at least one engine control comprises a device according to claim 35.

[REMARKS FOLLOW ON NEXT PAGE]